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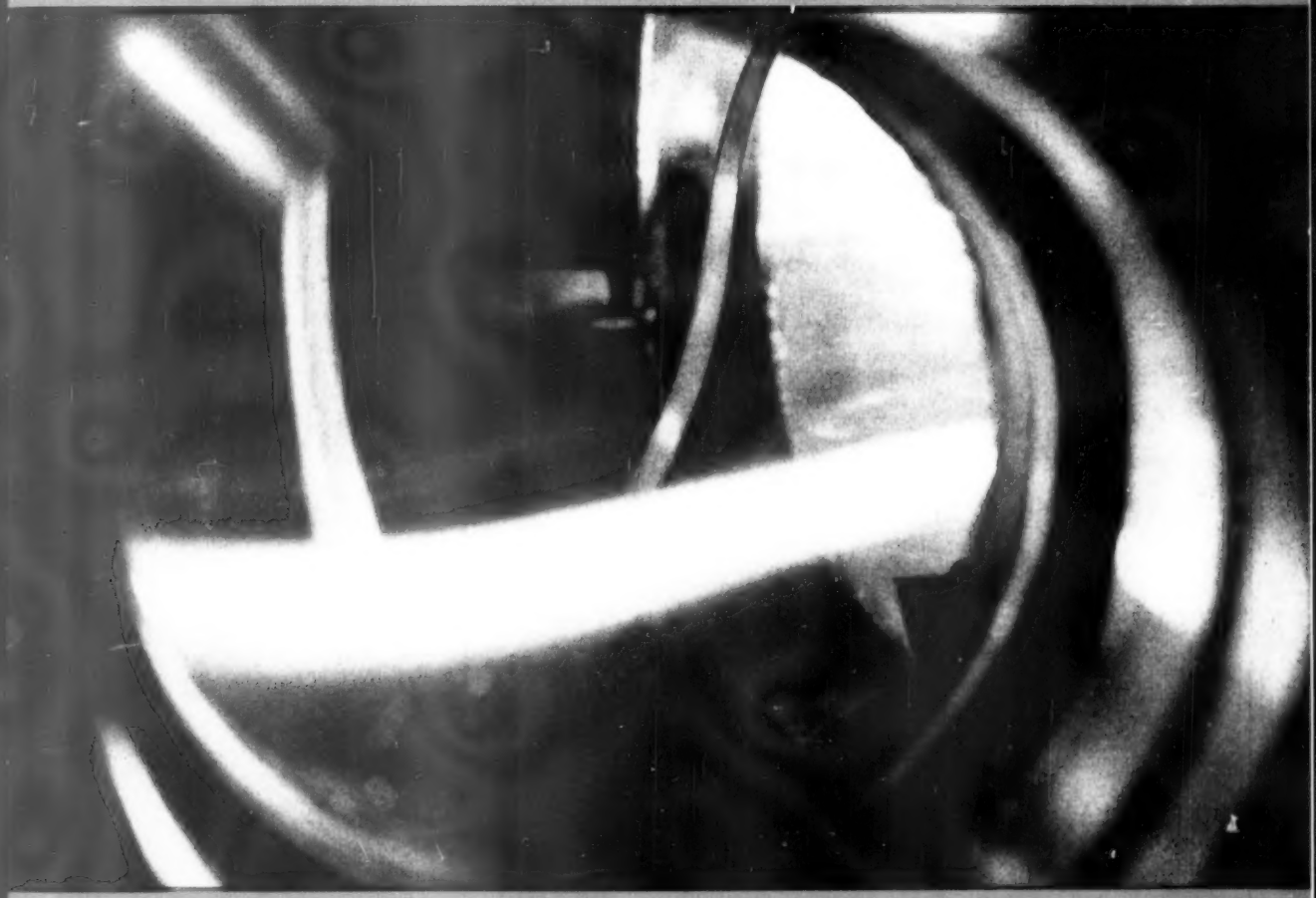
September 20, 1958

VOL. 74 NO. 12 PAGES 177-192

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



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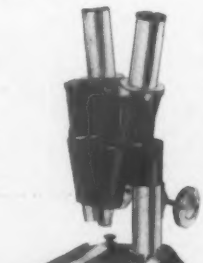

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EDUCATION

U.S. and U.S.S.R. Schools

A Science Service Grand Jury inquiry points out differences in Russian and American educational systems that reflect political and social differences in the countries.

➤RUSSIAN EDUCATION is not more effective than U. S. education, generally speaking, but it is more effective in science at the grade school, high school and undergraduate levels.

This is the opinion of experts who have studied the two systems, as ascertained by a SCIENCE SERVICE Grand Jury inquiry in which questions were answered anonymously. The jury consisted of educators who have been to Russia this year and experts who have made a long study of Russian education and manpower in science.

At the graduate level, U. S. education in science was judged to be markedly better that U. S. S. R. education.

The vote on "Russian education is more effective than U. S. education, generally speaking," was: "Yes" 17% (4); "no" 58% (14); not voting, 25% (6).

Upon the statements that Russian education is more effective in science, the results were: At the grade school level, "yes" 80% (19), "no" 8% (2), and not voting 12% (3); at high school level, "yes" 92% (22), "no" 0%, not voting 8% (2); at the undergraduate college level, "yes" 54% (13), "no" 31% (5), not voting 25% (6); at the graduate level, "yes" 17% (4), "no" 75% (18), not voting 8% (2).

The jury was asked to vote on: "The Russian method of virtually assigning individuals to careers in various fields is better than the U. S. method of freedom of choice." The results were overwhelmingly in favor of the U. S. method with 84% (20) answering "no," only 4% (1) saying "yes" and 12% (3) not voting.

One expert commented: "Let us quit acting scared, and pouring ashes on our heads. The last thing we want to do is emulate the Soviets in their practices. Incidentally, the sputnik was created by people educated in a system of considerably different format, and the Soviets have been critical themselves of their present educational methods."

"Job training is not a sufficient motivation to enable a student to get a competent education," another expert said. "Exploration of new ideas, comprehension of the accomplishments and feelings of men, and development of the society are necessary motivations to sustain education in the long pull. European education, on which the Russian system is patterned, has tended to give these greater emphasis."

Another opinion was: "Our education is better because it can be changed more easily to adapt itself to changing conditions."

Commenting on freedom of choice, one expert contended: "Russian children have freedom of choice upon entering an area of training. It is only after the choice is made that their freedom is limited by the narrowness of their training and the power of initial assignment by the state upon graduation. The system of assigning graduates for three years is good from the point of view of the state but not desirable from the point of view of some students."

On the other hand, another expert said: "Russian education is completely regimented and is designed to serve the objectives of the state and a planned economy."

This advice was given by another expert: "We could well cut down the time we give in elementary and secondary schools to non-cultural, non-scientific subjects, and step up the amount of training and the length of school sessions devoted to solid college-preparatory subjects, in both science and humanities."

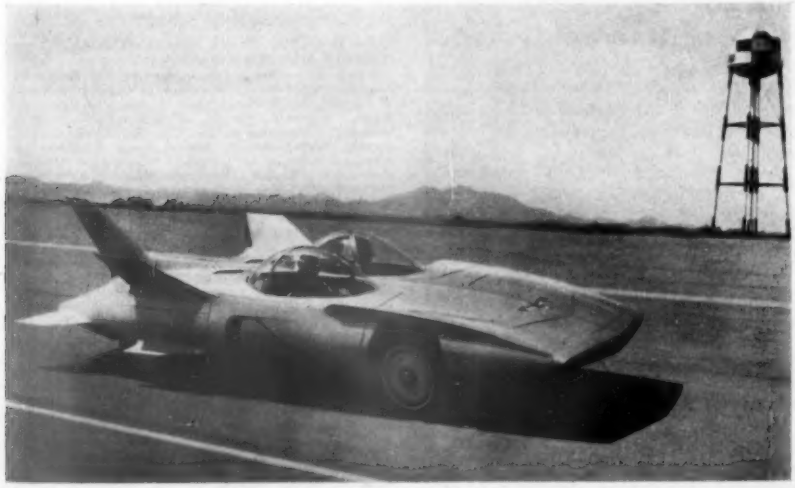
Similarly, another opinion was: "On the lower levels, Russian education is superior to ours because of better discipline and more thorough grounding in science and in foreign languages. In general, Soviet education is over-specialized and completely one-sided."

One expert warned: "Beware of the defensive attitude of American educationists who do not hesitate to distort the facts."

Another opinion was: "The Soviet system as a whole is a very effective tool to achieve economic progress and thus be a threat to world peace whenever it decides to behave in a warlike manner."

Another criticism was: "Soviet education is more impressive than U. S. education: it has mass-produced more in a shorter time. In Soviet statistics there is always some self-hypnosis in numbers. Given the same financial access to education as in the Soviet Union, there would be no problem in the U. S. once the influence of the National Education Association in elementary and secondary schools were relegated to the ash can where it belongs. The Soviets have merely picked up what we discarded in the last few decades under National Education Association pressure."

Science News Letter, September 20, 1958



SPACE AGE CAR—Tail fins and blunt nose are part of the experimental car's design.

ENGINEERING

"No Hands" Steering of Experimental Car

➤ A "NO HANDS" steering control is just one feature of the new experimental automobile built and tested by General Motors, John F. Gordon, GM president, has announced.

Primary features of the Firebird III, as it is called, are:

1. Wing-shaped Unicontrol handle that combines all steering, braking, accelerating and parking functions. The handle is mounted on a four-inch control stick located in the center of the car which is easily operated by either passenger.

2. Autoguide that provides electronic steering control.

3. Dual engine system that employs separate engines for car accessories and for driving the rear wheels.

4. A lighter, more compact gas turbine engine that uses 25% less fuel than earlier versions.

5. A single dial electronic temperature system that combines all conventional automotive heater and air conditioning controls.

Firebird III has an aerodynamic fiber glass body and is "pearlescent silver-gold in color."

In addition to furnishing the accessory power, the small engine drives a 110-volt generator. This generator, GM designers point out, provides 60-cycle electrical power which could provide power to run household appliances in the event of an emergency.

Science News Letter, September 20, 1958

MEDICINE

Work Aids Cardiacs

➤ SUITABLE employment instead of rest and retirement for the severe cardiac patient may become just what the doctor orders.

A study based on 19 persons who would normally be considered unemployable but who were successfully working in industrial and clerical jobs revealed that the physical condition of some of them actually improved after they started working, Dr. Alvin Slipyan of Elmhurst, L. I., N. Y., reports in the *Journal of the American Medical Association* (Sept. 13).

On the basis of his study, he suggests a possible change in the rule that persons with severe heart disease require constant rest and retirement from work.

Of the 19 studied, ten persons had had heart attacks, seven had rheumatic heart disease and two had hypertensive heart disease. They were employed by Abilities, Inc., of Albertson, L. I., N. Y., a company that employs only disabled persons.

The jobs required the effort of walking, but none included heavy labor.

Five of the postmyocardial infarction patients showed no change in physical condition after employment, three showed definite improvement, and one had increased attacks of pain but showed no increase in disability. One man died of a cerebral embolism, apparently related to an experience in which he was trapped in his car for more than an hour in a snowstorm.

Five of the rheumatic heart disease group showed no change in their condition after starting work and two improved.

One of the hypertensive heart disease employees showed no change in status and the other gradually improved.

Most industries refuse to hire cardiac patients because of the fear of absenteeism and compensation claims. Absenteeism was remarkably low, Dr. Slipyan says, and none of the 19 claimed compensation.

A five-year follow-up study of 431 men who had returned to work after their first myocardial infarction was reported in an earlier *Journal*. The study revealed that none of the patients who had another attack or developed heart failure claimed that it was due to their work.

Science News Letter, September 20, 1958

MEDICINE

Study Night Blindness

➤ NEW LIGHT has been shed on the cause and cure of night blindness.

What happens in the body, and especially in the eye, when an animal is deprived of vitamin A, a known cause of vision failure in dim light, has been studied by Prof. George Wald, biology department, and John E. Dowling, medical school student, of Harvard University.

The scientists found that:

Rats placed on a vitamin-A-deficient diet began using the vitamin A stored in their livers. Since the amount varies in individual livers, this may explain why it takes anywhere from a few months to years for humans to develop symptoms of night blindness.

When the supply in the liver was exhausted, the vitamin A level of the blood soon fell until there was none left in the blood.

At this point, the retina, the light-sensitive portion of the eye, began to lose its visual pigment because it no longer had a supply of vitamin A from which to make this substance, the scientists explain in the *Proceedings of the National Academy of Sciences* (July).

Although the amount of visual pigment steadily fell, the protein portion of the pigment remained at its normal level for several weeks. Then the protein began to decline. Microscopic examination of the retina of the eye showed the retinal tissues had begun to deteriorate.

However, doses of vitamin A shifted the direction of these changes, and vision began to improve. But if the night blindness passed the point at which the retina began to fall apart, the recovery took longer. This may explain why some humans responded slowly to vitamin A administration, the investigators point out.

This study opens a new area for fundamental research in the biological significance of vitamin A. No one knows the precise role the vitamin plays in the body.

Science News Letter, September 20, 1958

MEDICINE

The Cardiac Worker; Will He Face Unemployment?

➤ A STUDY of 89 employers' attitudes toward hiring the cardiac worker in St. Paul and Minneapolis revealed the following information:

1. For those companies that consider the age of the employee, it would appear that a cardiac's chances of stable employment might depend on a fixed retirement age rather than his cardiac condition.

2. Twenty of the 89 firms indicated that they would hire persons for initial employment who were known to be cardiacs. An unqualified "no" was given by 32. And 37 of the firms indicated that they would hire cardiacs sometimes, depending upon the nature of the position to be filled.

3. On the question of re-employment of someone who had been afflicted with a heart ailment during his employment with the company, a sense of moral obligation to the worker found strong expression among most of the interviewees. Only four of the 89 firms definitely said they would not continue to employ a cardiac.

4. Fifty-one of the firms indicated that they had some kind of policy regarding employment of cardiacs while 38 indicated that they had none.

Since many types of heart disease are prevalent in those persons from about the age of 30 to 65, many cardiacs fall in the age group that is making the greatest social and economic contribution to society, Dr. Leo G. Reeder of School of Medicine and School of Public Health, University of California, and George A. Donohue of the University of Minnesota, point out in their report in the *Journal of Chronic Diseases* (Aug.).

Science News Letter, September 20, 1958

SCIENCE NEWS LETTER

VOL. 74 SEPTEMBER 20, 1958 NO. 12

Edited by WATSON DAVIS

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N.W., Washington 6, D. C., NOrth 7-2255. Cable Address: SCIENSERVC.

Subscription rates: 1 yr., $5.50; 2 yrs., $10.00; 3 yrs., $14.50; ten or more copies in one package to one address, 7½ cents per copy per week; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

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Printed in U.S.A. Entered as second class matter at the post office at Washington, D. C., under the act of March 3, 1897. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40 P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283) authorized February 28, 1950. Established in mimeograph form March 13, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Reader's Guide to Periodical Literature, Abridged Guide, and the Engineering Index. Member Audit Bureau of Circulation.

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PUBLIC HEALTH

Encephalitis Outbreak

Sleeping sickness, or encephalitis, is increasing in some areas of the West and Southwest. Public health officials are working to keep the outbreak from spreading.

➤ SLEEPING sickness, the dread encephalitis, is not a strange disease afflicting only peoples in distant Africa or Asia. It is right at home in the United States. And this year's heavy spring rains and a wet summer have increased the likelihood of encephalitis outbreaks: swamps, marshes and stagnant waters are breeding grounds for the mosquitoes that carry the disease-causing virus.

So far this year, California reports 31 confirmed cases of the disease, mostly in the central valley area. Utah reports 20 cases with four deaths, according to the most recent reports received at the U. S. Public Health Service in Washington, D. C. Colorado has 14, New Mexico, 15 cases and Wyoming has five or six cases reported.

Medical science can offer little to help those afflicted with the disease. There is no known treatment, no "wonder drugs."

When a person comes down with encephalitis all a doctor can do at present is to treat the individual symptoms. Pills can be given to alleviate the headache, the vomiting, etc., but nothing can be done to knock out the disease. As a result, the mortality rate has been as high as 65% in some epidemics. Often, however, depending on the type of encephalitis, the mortality rate is lower.

In the current western outbreaks two types of encephalitis are thought to be prevalent. Neither one is the same as the virus now causing thousands of cases of sleeping sickness in Japan and South Korea.

One type is the St. Louis encephalitis, so called because of the outbreak of the disease in that city 25 years ago that resulted in more than 1,000 cases. This type of sleeping sickness is now endemic in the United States, which means that there are always a few cases reported each year.

The other type is called western equine encephalitis that earned its name because it was first discovered attacking horses and mules.

Diagnosis of encephalitis is often difficult because symptoms of this virus-caused disease are like those of many other diseases. Symptoms include headaches, vomiting, a marked slowing of thought with intellectual and emotional "laziness" and the development of major psychoses. In some forms of the disease, paralysis may develop. Even when recovery occurs there can be mental impairment.

Public health experts claim the human disease does not reach serious enough proportions in the United States to warrant the development of a vaccine for mass inoculations. In most years, they say, the number of cases does not exceed a couple of hundred. As a result there is no vaccine for humans. There is one for horses.

Last year, Louisville, Ky., reported 200 cases.

According to the public health officials, the best preventive is destroying the mosquito carriers and their breeding places. DDT is still one of the most effective agents for accomplishing this. *Aedes aegypti*, a vector for yellow fever too, and *Culex tarsalis* both transmit the virus that causes the equine encephalitis. Apparently, however, both men and horses seem to be secondary hosts for the disease. Wild birds are the important carriers.

Usually the disease travels from mosquitoes to birds to mosquitoes. When the mosquito population flares up, as it did this summer, the insects take to biting men and an encephalitis epidemic may be on. Chances are slim that other animals, such as cattle or bats, which have been implicated in other virus diseases, play a role as carriers.

The same tick, *Dermacentor andersoni*, that carries the Rocky Mountain spotted fever has been found to carry equine encephalitis. It seems to be able to keep the virus and pass it on to its offspring.

There is little danger that individuals who have the disease act as carriers, spreading it into uninfected areas. For example, public health officials are not concerned about the dangers of the disease entering the country through persons traveling from Japan and South Korea where there is a sleeping sickness epidemic sweeping the country.

WONDER WINDOW — Sensitive electronic-mechanical contacts on the outside of this especially designed, experimental window set off an electric motor which closes it.

While there are no provisions as such for a state or local area to receive Federal aid in fighting an outbreak of encephalitis, state health department officials can call on the Federal Public Health Service for "epidemic aid." Under these circumstances advisers and experts in the problem will be sent to study the situation. There is no Federal aid program for mosquito abatement, although several bills for such measures were introduced during the last Congress.

Science News Letter, September 20, 1958

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Saturday, Sept. 27, 1958, 1:30-1:45 p.m., EDT

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio network. Check your local CBS station.

Dr. Byron T. Shaw, administrator, Agricultural Research Service, U. S. Department of Agriculture, Washington, D. C., will discuss "Pioneering Research for Agriculture."

ENGINEERING

Window Opens, Closes Automatically

➤ A WINDOW that can be controlled by weather conditions has been perfected by the Truscon Division of the Republic Steel Corporation.

Called "wonder window," it reacts automatically, closing if the temperature inside the house drops below a pre-determined setting, rain or snow falls, or a strong wind blows.

Reaction of the window to rain and snow is determined by two "electric eyes" outside of the window just below the sill. When rain or snow contacts the eyes it completes a circuit and electronic relays actuate an electric motor causing the window to close.

A tiny mechanical flapper that is placed in a panel above the window reacts to winds over certain velocities.

The experimental window is made to serve as its own storm window. Each vent consists of two panes of glass sealed together after the air is removed from between the panes. It is weather stripped with a tight sealing vinyl.

Every time the wonder window opens, a screen automatically rises from under the sill. When the window closes, the screen backs down into its housing. The screen always operates automatically regardless of whether the vents are operated manually or automatically, so that you never have to look through a screen when the window is closed.

C. B. McGehee, Truscon's general manager of sales, emphasized that the company does not plan to market the window either at present or in the foreseeable future.

Science News Letter, September 20, 1958

NICE CAR deserves a NEW KozaK ?

BARGAIN OFFER: One $3 regular and one $4 SUPER Auto DRYWASH cloths —$7 value for $5. Safely wiping and DRYwashing nice cars for 33 years. Save their cost dozens of times. Guaranteed. KozaK, 155 S. Lyon St., Batavia, N. Y.

ANT FARM FASCINATES CHILDREN AND ADULTS

Watch busy worker ants dig tunnels, build bridges, move mountains through the clear plastic walls of this escape-proof Ant Farm! Educational. So fascinating children and adults will watch hour after hour! 6" x 9". Contains a complete country homestead, with barn, silo, windmill. Comes with Ant Watcher's Manual. Ants shipped in separate container. Complete $2.79 ppd.

STOP STRAINING! USE A HEARTSAVER SNOWPLOW!

Clean snow away quickly and easily, without strain on heart and back muscles, with a Heartsaver Snowplow! Made of Magnesium —stronger than steel, lighter than aluminum. Weighs only 2 pounds. Lets you push nothing but the snow! Wide rounded blade clears a path about half the width of a standard sidewalk. Cuts shoveling time in half! Strong mobile wheels roll snow away—easy as pushing a carriage. Completely rustproof, with "no-stoop" 54" tubular handle. Order NOW. Supply limited.

18" snowplow with rollers ..... $6.98 ppd.

24" snowplow with rollers ..... $7.98 ppd.

Special!

ONE DOZEN TROUT FLIES Only 88¢

Sensational buy! Set of a full dozen handtied trout flies, in beautiful colors so lifelike no trout can resist 'em—at a price no fisherman can pass by! This rare bargain made possible only by a special arrangement with one of the world's best fly makers. Set of 12, in floating balsawood box with cork runner for keeping flies in position ..... 88¢ ppd.

NEW "MOOD" PILLOWCASE FUN GIFT OF THE YEAR!

Fine muslin pillowcase 42" x 36" is embellished with a "Yes" design in pink on one side, and a "No" design in blue on the other! Designs are attractive and colorfast. Each ..... 88¢ ppd.

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MEDICINE

Study Radiation Sickness

➤ THE SEVERE illness following X-rays and radioactive radiation in the treatment of cancer can be treated successfully by transfusions of blood and its leucocyte and thrombocyte components, a Russian group headed by A. A. Bagdasarov told the Second United Nations International Conference on Peaceful Uses of Atomic Energy meeting in Geneva.

Studying 250 patients with various cancerous conditions requiring radiation, it was found that 80% were aided by the transfusions to the point that it was possible to continue the radiation treatments. The leucocyte preparation used at the Central Institute of Hematology and Blood Transfusion was made from non-citrated blood preserved with the aid of ion exchange resins. This gave a longer life for the leucocytes.

The female is tougher than the male, at least in mice, when it comes to resisting the effects of large doses of atomic gamma radiation, Drs. W. L. Russell and Liane Brauch Russell of the Oak Ridge National Laboratory, Tenn., reported. The offspring of irradiated female mice have fewer changes than those caused in the progeny when the fathers alone were subjected to radiation. This female advantage may apply to human mothers and gives a hope that the efforts of atomic war damage may be less than anticipated.

Even a single heavy dose of X-radiation to female rats 40 days old is followed by a large amount of breast cancer within 11 months of the exposure, a group from Brookhaven National Laboratory's medical department led by Dr. V. P. Bond, reported. Removal of the ovaries before radiation reduced the cancer incidence, but shielding of head and ovaries did not reduce the effects of the radiation given over the whole body. This rat experiment may also have human applications.

Contrary to previous ideas, two U.S.S.R. scientists. M. N. Livanoy and D. A. Biryukov reported that there are profound effects upon the brain and central nervous system from ionizing radiations.

Slow Life Processes

➤ THE LIFE PROCESSES of mice and rats can be slowed when they are given relatively large amounts of heavy water, which contains deuterium, instead of regular water.

The animals usually die when the heavy water rises to about a third of the natural body water but no permanent adverse effects were found when the level was maintained at 25% heavy water.

In a report prepared for delivery at the atomic energy meeting, ten United States scientists reported their studies of the effects of deuterium on growth processes, They were also looking for chemical compounds that could be used in disease treatment.

Heavy water, found in small proportions in all natural water, is the form of hydrogen containing double-weight deuterium. Its main use is as a moderator to slow down neutrons in atomic reactors but it also has value in probing fundamental biological problems.

Deuterium seems to retard most greatly the growth of the most active living cells, of which cancer is an abnormal example.

The scientists therefore implanted cancerous tumors in mice, then let them drink heavy water. They found tumor growth was slower in these mice than in those drinking ordinary water.

Another possible application of deuterium, the scientists suggested, would be in slowing down metabolism of the living system so that a medicine administered in reasonable quantities would have more time to act before it is eliminated from the body.

The scientists conducting this research are Dr. Joseph J. Katz, Dr. Henry L. Crespi, Dr. Asher J. Finkel, Dr. John F. Thompson, William Chorney and Dr. Nobert J. Scully of the Argonne National Laboratory, Lemont, Ill.; Dr. Robert J. Hasterlik of the Argonne Cancer Research Hospital, Chicago; Dr. William Lester Jr. and Dr. Sung Huang Sun of the Suburban Cook County Tuberculosis Hospital-Sanitarium, Hinsdale, Ill.; and Dr. Robert L. Shaffer of the University of Chicago.

Science News Letter, September 20, 1958

ENGINEERING

"Teen-Age Pink" Is Only A Number to Color Sorter

➤ COLORS of new fall clothing can be analyzed and described by an optical-electronic device that makes the human eye obsolete.

A merchant in Des Moines will be able to telegraph a New England mill for rush shipments in specific colors by reference to numbers rather than to "toast brown," or "sky blue," which may mean different shades to different people.

A device long used by chemists and physicists, a spectrophotometer, has been developed by scientists of the National Bureau of Standards to scan a swatch of fabric or other colored specimen and plot on graph paper the percentages of red, orange, yellow, green, blue and violet contained in the sample.

The recording spectrophotometer, or light analyzer, is coupled with a high speed computer that translates the analyzer's findings almost instantaneously into terms of industrial and scientific color codes already in wide use.

Thus, persons already trained in use of color code keys and books will be able to use information supplied by the device without having to learn a new system. Books and guides already distributed will not have to be reprinted.

Science News Letter, September 20, 1958

AGRICULTURE

Sick Plants Get Pills

➤ DRUGS for a wilted cabbage or a rusted wheat may hold the answer to diseases that cost the American farmer billions of dollars in lost crops.

The wilted cabbage and the rusted wheat did not get that way because of hot weather or by being left out in the rain. Fungi cause the wilt and rust diseases which, along with the root rots and blights, are among the most important diseases affecting crops.

Today, however, Dr. A. E. Dimond of Connecticut Agricultural Experiment Station, New Haven, said, with basic research underway in the field of chemotherapy (the use of chemical compounds to fight disease in plants) there is promise that plants, like animals, may be given a "pill" that can cure disease.

Antibiotics, fungicides, growth hormones such as 2,4-D, and anti-growth compounds such as maleic hydrazide are being studied as chemotherapeutic agents for sick plants, Dr. Dimond told the American Phytopathological Society meeting in Bloomington, Ind.

By discovering the biochemical pathways unique to fungi, scientists may be able to introduce substances into the plant that will cure diseases already infecting a plant, he pointed out. This would be an improvement over disease prevention methods that rely on sprays and other substances that must be used before the disease takes hold.

Some compounds, streptomycin is one, are useful against both plant and animal diseases caused by bacteria. Use of these drugs on food crops is, of course, Dr. Dimond said, strictly regulated to prevent humans receiving a harmful quantity of the antibiotic.

Chemotherapeutic substances fight plant diseases in three ways: they may kill or inactivate the disease organism inside the plant; they may neutralize toxins produced by the organism; and they may increase the plant's resistance to disease Scientists are trying to find compounds that can be tailor-made to harm the disease organism but not the plant.

"Tomorrow," Dr. Dimond said, "we may treat plants with a compound that lets them resist infection so effectively that the pathogen may no longer be able to maintain itself." Already, purine compounds are being successfully used in the laboratory to combat virus diseases in plants. These are still too expensive to be used in the field, however.

Science News Letter, September 20, 1958

CHEMISTRY

Irradiation for Rubber

➤ ATOMIC radiation may soon replace heat and chemicals in vulcanizing some rubber compounds.

Irradiation vulcanization will not ordinarily be as cheap as conventional vulcanization. In fact, the actual radiation vulcanization step in rubber processing will probably be more expensive for the next ten years, Dale J. Harmon, B. F. Goodrich Research Center, Brecksville, Ohio, told the chemists at the American Chemical Society meeting in Chicago.

However, irradiation will eliminate many compounding ingredients, and "appreciable saving may be introduced by the elimination of such items as curing pits, molds and curing ovens," he said.

Vulcanization, whether with heat and chemical accelerators or with atomic radiation, is the process of curing sticky raw rubber to form tough, bouncy, useful products.

Until someone discovers a method of reducing the radiation dose necessary for vulcanization, and thus reduce its cost, irradiation vulcanization's chief advantages will be:

1. Curing rubber goods that are difficult or impossible to cure by chemical means.
2. Curing thick goods uniformly all the way through.
3. Curing extruded goods, such as tubing, without heat.

"Engineers will be free to revise their production lines to capitalize on the high-speed, continuous-flow advantages of radiation cures," Mr. Harmon added.

Another advantage, although indirect, mentioned by the rubber chemist is irradiation vulcanization's aid in solving the problem of what to do with waste products of the increasing number of atomic reactors.

"If large scale industrial uses (such as vulcanization) for these materials can be developed," he said, "they will aid in relieving the waste disposal problem to some extent and will also assist in reducing the cost of operation of nuclear power plants."

Convert Oil Shale to Gas

➤ COLORADO OIL shale can be converted directly to heating and fuel gas by a highly efficient new process.

The process produces gas that is about as efficient and economical as natural gas, and more so than most manufactured gases, Eugene B. Schultz Jr., Institute of Gas Technology, Chicago, reported to the chemists.

An important advantage to the process, besides by-passing the liquid oil stage, is that it converts between 90% and 100% of the active matter in oil shale to fuel. Existing oil extraction processes utilize only about 80% of the active organic matter in the shale, Mr. Schultz pointed out.

He cautioned that the figures are only preliminary calculations based on laboratory experiments performed in cooperation with his co-author on the report, Dr. Henry R. Linden, the Institute's research director.

Hydrogasification, as the process is called, was described as a one-step process during which crushed oil shale is treated wtih hydrogen at high temperature and pressure.

Science News Letter, September 20, 1958

"HOT" TREE—Carbon-14 can be seen distributed in both the cellulose and bark, with sharpest activity near the cambium in the third-year growth ring.

FORESTRY

First Radioactive Injected Pine Trees Examined

➤ "HOT" TREES may help the tire and cellophane industries toward greater production efficiency and lowered costs.

Using ordinary hypodermic cartridges, scientists have injected radioactive carbon, C-14, into two-year-old pine trees for one of the first controlled experiments in the study of cellulose growth in living trees.

First results indicate that there is a strong possibility for higher future yields of cellulose per tree plus improved quality for the large cellulose consumers. Dr. R. L. Mitchell, manager of Rayonier's Eastern Research Division, Whippany, N. J., said. Rayonier scientists have completed the dissection of one of the "hot" trees and have studies underway using the tagged components from bark, lignin, cellulose and the hemicelluloses.

Cellulose in quality suitable for high tenacity rayon has been isolated from the radioactive portion of the tree for further laboratory investigation, particularly in connection with rayon process mechanisms.

The work is still in the preliminary stages and significant conclusions cannot be firmly drawn, he said. But, this first work in the feasibility of tagging cellulose as it grows in the tree has been positive, showing a substantial lay-down in growth processes with only minor diffusion.

Continuing studies should "throw new light upon several unknowns" in both cellulose chemistry and silvichemistry, and eventually results in new technical and product advances, Dr. Mitchell noted.

Science News Letter, September 20, 1958

CHEMISTRY

Purify "Chunk" Of Heavy Matter

➤ UNIVERSITY of California scientists have made and purified a "chunk" of the heaviest building block of matter ever obtained in weighable and visible quantities.

The "chunk" is one thirty-millionth of an ounce, about one microgram, of element 98, californium, a synthetic form of matter that does not exist naturally on earth and may exist only in supernovae, or exploding stars.

Production of the minute quantity of californium, which may become the most useful heavier-than-uranium element next to plutonium, was made by modern alchemical processes in a nuclear reactor.

Six years ago the scientists put one-fourth of an ounce of plutonium into the Atomic Energy Commission's Arco, Idaho, materials testing reactor. There the plutonium atoms were "fattened up" with neutrons until a reasonable quantity had turned into californium.

Element 98 is especially important because it undergoes spontaneous fission, yielding neutrons. Californium may permit plumbing mysteries of the fission mechanism that have previously been unapproachable.

For example, by cooling californium and aligning the nuclei magnetically, then observing directions of fission products and nuclei, it may be possible to observe new facts about the nucleus at the moment of fission. It can be used also as a general neutron source.

Studies of properties of the element showed it to be colorless and paramagnetic. The element is about 1,000 times "hotter" than radium.

Isolation of californium was reported by Stanley Thompson of the Berkeley laboratory to the Second United Nations International Conference on Peaceful Uses of Atomic Energy meeting in Geneva. His associates in the work were B. B. Cunningham, Ray Gatti and Llad Phillips, all members of the chemistry group directed by Nobel Laureate Dr. Glenn T. Seaborg.

Science News Letter, September 20, 1958

ENGINEERING

Electric Transmission Breakthrough Achieved

➤ A "MAJOR BREAKTHROUGH" in transmission of extremely high voltages may solve some of the problems involved in the vastly increasing demands for electrical power in the United States.

Announced in Leadville, Colo., by the Westinghouse Electric Corporation, the "breakthrough" was achieved in a "giant outdoor laboratory" where transmissions up to 500,000 volts were maintained for extended periods of time.

Previously, the highest sustained transmissions attained 345,000 volts.

"We are now able to . . . construct transmission lines capable of handling at least 500,000 volts at virtually any altitude up to 12,000 feet," J. K. Dillard, manager of the Westinghouse electric utility engineering department, Pittsburgh, said. "We consider this feat a major breakthrough in power transmission."

At the Westinghouse plant in Pittsburgh, Bill Lloyd of Mr. Dillard's department said that U. S. electric power production has doubled every ten years for the last several decades and is expected to continue increasing tremendously. "This," he said, "is why the achievement is of far-reaching importance."

It provides "a superior means of moving very large blocks of power over great distances economically," he explained.

Many utility companies are working out power pool networks which require long distance transmissions. With the new equipment, Mr. Lloyd explained, utility companies could trade power in situations where one is overloaded and another has an excess of power available.

The new equipment includes transmission lines which reduce power losses through a corona effect. This is the leakage of electricity through nicks and scratches in the lines producing a visible glow, or corona. It also causes radio interference and degeneration of insulation materials. The corona effect is especially troublesome in thin air at mountain altitudes.

Mr. Lloyd claims that the transmission lines and other newly developed equipment make it possible to send power over fewer lines.

The outdoor laboratory at which the experimental work was done was constructed by the Public Service Company of Colorado.

Science News Letter, September 20, 1958

ENTOMOLOGY

Mineral Plus DDT Makes Yard Mosquito-Proof

➤ NOW YOU can dust your back yard to make it mosquito-proof.

Prof. William R. Horsfall, a University of Illinois entomologist, reported that a mixture of ten parts granulated vermiculite, a mineral much used in agriculture, to one part DDT will keep an area free from mosquitoes for as long as a week, depending on the weather.

Two pounds will do a good-sized lawn, the scientists said. While the mixture is not dangerous to pets, certain precautions should be used in handling the insecticide. Avoid contamination of food or places where food will be placed. Also avoid dusting growing vegetables and fruits, or using it more than once a week. Do not overdose, Prof. Horsfall warned.

Small quantities of the vermiculite-DDT mixture should be available from commercial insecticide dealers. It has been used only in large quantities by mosquito control districts until now.

Applied one or two hours before your back yard is to be used, the golden colored mixture quickly becomes invisible.

Science News Letter, September 20, 1958

IN SCIENC

BIOLOGY

"Clock" Tells Mating Ant When to Leave Nest

➤ THERE IS an internal "clock" in two species of ants that apparently tells the male when it is time to take off on a mating flight.

Dr. Elwood S. McCluskey of Stanford University repors on experiments with the ants' "clock" in *Science* (Sept. 5).

Alternating periods of light and dark were used. The fact that increases in activity preceded changes in lighting suggests an internal "clock" is operating, Dr. McCluskey says.

Although the ants' activity coincided with various light periods according to species, their daily rhythm was maintained even in the dark.

With their clocks "set" for emergence from the nest at a particular time, harvester ants were on time for their nuptial flights. Since mating takes place within the nest for Argentine ants, their exit rhythm may be a vestige of a time when they did have a nuptial flight, the scientist suggests.

Science News Letter, September 20, 1958

VIROLOGY

Throw More Light On Secrets of Virus

➤ MORE LIGHT, literally as well as figuratively, has been thrown on the virus' infectious core and its protein suit of armor by scientists at the University of California at Los Angeles.

Using ultraviolet light as a probe, Dr. Albert Siegel, assistant research botanist, and Dr. Amos Norman, assistant professor of radiology, have found that the tobacco mosaic virus can be inactivated by both short and long ultraviolet wavelengths.

At the short wavelength inactivation is apparently due to damage to the protein armor. This damage prevents the nucleic acid from getting out of its armor, which it must do in order to be infectious.

There is an indication that the nucleic acid is still "alive" or infectious, but as long as it is confined in the protein it is harmless.

At longer wavelengths inactivation of the virus is apparently due to absorption of ultraviolet light by the nucleic acid itself. One strain of the virus is much more resistant to ultraviolet at longer wavelengths than the other. The resistant strain is protected by the way its nucleic acid core is banded to its protein armor.

It is through such painstaking technical procedures that chemical properties of the virus are being more clearly defined and scientists are learning more about the chemical differences between living and nonliving matter, Dr. Siegel points out.

Science News Letter, September 20, 1958

NCE FIELDS

PHYSICS

Nations Attempt to Make Thermonuclear Power

See Front Cover

➤ SCIENTISTS in Great Britain, the U.S.S.R. and in the United States are attempting to solve the problems of harnessing the hydrogen bomb. Research results were presented at the Second International Conference on Peaceful Uses of Atomic Energy held in Geneva, Switzerland.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows the Oak Ridge National Laboratory's thermonuclear experimental machine in operation. An intense direct current carbon arc runs through the length of the machine. When a beam of molecular ions passes through the arc, the molecular ions are broken into atomic ions. These atomic ions, held by a magnetic field, circulate in a glowing ring which may be seen through the side window of the machine.

The glowing gas is called the "plasma." (See SNL, May 17, p. 307; Sept. 6, p. 151; Sept. 13, p. 165.)

Science News Letter, September 20, 1958

MEDICINE

Vaccine Shots Protect Mother-to-Be and Child

➤ ONLY TWO injections of poliomyelitis vaccine can protect both a pregnant woman and, later, her newborn child against the virus disease, a team of University of Minnesota researchers report.

Pregnant woman are extraordinarily susceptible to paralytic poliomyelitis, scientists have found. Possibly their vulnerability results from the action of endocrine gland secretion. Research with experimental animals shows that cortisone acts to increase their susceptibility to polio and the human reaction may be similar.

Results of this study indicate further ways to protect the mother-to-be.

Examinations of 138 pregnant women showed that almost two-thirds lacked antibodies to one or more of the three types of polio virus. However, after two injections of Salk vaccine, 73% of the women previously without complete antibody protection developed antibodies to all three types.

Along with the increased protection for the mother-to-be during a particularly poliosusceptible period, there was an increase in the amount of polio antibodies present in the newborn infant's blood.

The scientists found that in about five weeks the infants had lost half their passively acquired antibodies. The amount of antibodies they retained after birth was directly related to the level of antibodies present at birth. Those with high levels had measurable quantities of antibodies as late as nine to 12 months of age.

"Where supplies of poliomyelitis vaccine are limited," the scientists conclude, "assignment of priority to pregnant women therefore seems justified."

In 77 cases of injecting year-old infants with the vaccine, the response was not as good as that obtained with the pregnant women.

Injections of the vaccine by the intradermal route gave results comparable to doses five times larger administered subcutaneously.

Drs. Mauricio Martins da Silva, Konald A. Prem, Eugene A. Johnson, John L. McKelvey and Jerome T. Syverton report their research in *The Journal of the American Medical Association* (Sept. 6).

Science News Letter, September 20, 1958

MEDICINE

New Steroid Helps Treat Rare, Fatal Disease

➤ A RARE AND sometimes fatal disease has shown response to a new drug, but not without some side effects.

The disease, systemic lupus erythematosus, is a chronic crippler. Its symptoms are similar to rheumatic fever and rheumatoid arthritis, manifesting itself in fever, sore and swollen joints, face rash and eruptions, and heart damage. In most cases, it is fatal and the exact cause is unknown.

A new steroid, triamcinolone, was administered to 29 patients suffering from lupus, Dr. Edmund L. Dubois, department of internal medicine, University of Southern California, reports in *Journal of the American Medical Association* (July 26).

Many patients are helped more by this steroid than by the older ones, he says. Of 14 patients who had received prior therapy with all of the older anti-inflammatory hormones, seven were better controlled and felt better with triamcinolone than with previously given steroids.

Male patients exhibited none of the Cushingoid features, rounded face, obese neck and trunk, suggesting that in males, this may be the agent of choice.

However, the most serious side effect of the drug in patients with lupus was found to be muscle weakness, and facial hair growth in some women, indicating that this steroid should not be used to initiate therapy on the average patient. The muscle weakness appeared in six of the 29 patients from four to 32 weeks after starting therapy.

The pattern of clinical improvement from the new drug closely paralleled that obtained by previous treatment with older steroids, and all clinical and laboratory abnormalities disappeared, with the exception of long standing renal involvement. In addition, the new steroid, manufactured by Lederle Laboratories under the trade name Aristocort, seemed to induce progressive weight loss in 18 patients, Dr. Dubois concludes.

Science News Letter, September 20, 1958

IMMUNOLOGY

Dormant Antigens May Cause Reactions

➤ EVIDENCE that substances such as pollen, foreign proteins, and vaccine particles are causing allergic reactions and maybe arthritis has been presented in Pasadena, Calif.

All of these substances, called antigens, induce the body to produce antibodies that fight disease or immunize. In addition, they are suspected of causing reactions such as sneezing, rashes, and digestive disturbances by an investigation team from California Institute of Technology.

These antigens were found in the liver, instead of being completely excreted as was expected, Drs. Dan H. Campbell, professor of immunology, and Justine Garvey, chemist, at Caltech, reported.

Ordinarily, they would be removed from the body within days. However, radioactive tracer experiments on animals lead the scientists to suspect that some of the antigens "hibernated." When stimulated by new antibodies from booster shots, the old antigens may release the antibodies to which they have been attached, and resume their job of producing new antibodies, which can cause reactions, Dr. Campbell hypothesized.

Science News Letter, September 20, 1958

PUBLIC HEALTH

One of Every 80 Americans Is Diabetic

➤ ONE OUT of every 80 Americans is diabetic, but half of them do not know it. Furthermore, almost 40% more women, than men, die from this disease.

Diabetes mellitus, is the eighth leading cause of death in this country, it was reported in the Parke Davis & Company's publication, *Patterns of Disease*.

One of the reasons diabetes remains a serious disease is the high rate of "hidden" diabetics, the report stated. Some of the symptoms of the disease include general weakness or tiredness and a sore, abscess, infection or slow-healing wounds, itching, weight loss and excessive thirst.

The disease is far commoner in older people than in the young, with 40 as the danger age at which concentration of new case findings of diabetes begins. Diabetes is a major cause of disease among elderly people.

Life expectancy of the diabetic has improved greatly because of the use of insulin coupled with a better understanding of the disease mechanism and improved methods of treatment but it is still shorter than that of the general population.

One comprehensive study revealed that for diabetics who have survived 20 to 24 years of the disease, eye damage was the leading single complaint, afflicting 82% of the victims, and hardening of the arteries was second, accounting for 73%. The leading cause of death among diabetics is heart disease that accounts for almost 50% of all diabetic deaths. Vascular lesions of the central nervous system rank second.

Science News Letter, September 20, 1958

AERONAUTICS

Here Come the Jets!

The new jet age spells out a revolution in transportation, with more people traveling farther and faster than ever before.

By DAVID PURSGLOVE

➤AMERICA'S CIVIL jet age which dawns this fall will be the most carefully prepared "revolution" of all of civilization's great advances.

To accommodate an age in which more people will travel faster, farther, and in greater comfort than ever before, the United States has deliberately lagged behind some other nations in order to plan, test and replan a complete overhaul in the aviation industry.

To be economical, jets must be big. They must fly high, and they must fly at certain "best" speeds.

These huge planes, carrying many more passengers than any of our existing airliners, call for longer runways, new airports and, above all, ground facilities for enormous numbers of persons clamoring for baggage, breakfast and transportation to town.

As soon as the passenger realizes part of the jet airliner's great speed advantage is being wasted by the bumper-to-bumper trip between town and airport, the wait at the terminal, the wait for clearance at the end of the runway and the unproductive round-and-round landing pattern flight at busy airports, he will demand improvements that transcend the airplane itself.

Better Air Travel Planned

These improvements already are being planned, and some of them put into service.

When the first civilian jet, a Boeing 707 delivered to Pan American World Airways, leaves New York's International Airport on a scheduled passenger-carrying flight to London in November, it will climax countless man-years of preparation by the airlines, aircraft manufacturers, Government civil aviation agencies and the U. S. Air Force.

Jet service between points within the United States will be inaugurated shortly thereafter by American Airlines and National Airlines also using the 707's, the civilian counterpart of the Air Force's KC-135 jet tanker.

The first change to be noticed by the new jet-age traveler is the airplane itself. Three basic models are scheduled for near-future delivery to U. S. airlines. The Boeing 707, Convair 880 and Douglas DC-8.

All the new civil jet airliners feature extremely swept-back wings, with at least as much of the fuselage protruding in front of the wing as behind the wing.

Even more striking is the enormous size: ranging from 124 feet to 150.5 feet long. The shortest jet is longer than seven modern station wagons and the longest is longer than a 12-story building is tall.

Something the passenger will not see, but will undoubtedly hear about from stewardesses who already are learning the planes like books, are the enormous fuel tanks. The average jet will carry 17,400 gallons of kerosene. If this were gasoline, it would power a car for 22 years, driven 12,000 miles per year.

Kerosene has long been a standard jet fuel. It is much cheaper than gasoline, and a little bit safer should an accident occur.

The chairman of the Civil Aeronautics Administration's Jet Planning Group, Bart Spano, collected volumes of data on kerosene. Then, as a final test, he took samples of kerosene, JP-4 military jet fuel, and aviation gasoline to his home where he personally determined the ease of ignition at 70 degrees Fahrenheit of spilled fuel by bringing flames near small saucers of the fuel.

However, Mr. Spano pointed out, kerosene has a drawback that adds slightly to the difficulty and expense of using it. It has a greater affinity for water than do the other fuels. This means that its ground storage, pumping, and storage within the plane must be handled with great care to prevent a tendency to freeze at the 25,000 to 40,000 feet altitudes at which jets operate best.

The CAA's jet planning expert credits the Air Force with a major assist in preparing for the new civil jet age.

The Air Force not only has made available its vast store of information gathered through years of jet operation, but has actually trained personnel in jet operation and has turned over to the CAA several jet planes for familiarization and orientation use.

In Mr. Spano's words, "Air Force help has been invaluable—without the Air Force, there would be no civil jet age now."

The Air Force began helping the airlines prepare for the jet age in the spring and summer of 1954 when about 50 airline chief pilots were trained at the T-33 instrument school at Moody Air Force Base, Ga.

The Strategic Air Command has carried many airline chief pilots on orientation flights in its jets, and all branches of the Air Force have helped train future crews of the jet liners in various schools, symposia and meetings.

In the meantime, makers of the planes also have been training crews of the airlines which will use the planes. Typically, the Boeing Airplane Company, Seattle, Wash., uses a prototype 707 to train and check-out a few key chief pilots of Pan American World Airways. These in turn train a corps of "training pilots" who then train the crews who will use the 707 in routine flight.

REVOLUTION IN TRANSPORTATION—After four years' testing, the Boeing 707 will go into service this fall. Pan American World Airways will use it to shrink flight times between the U.S. and Europe by 40%. Soon afterward American Airlines and National Airlines will use it to shrink similarly the travel time between cities within the U.S. Experience gathered by the Air Force of the 707's military sister ship, the KC-135 jet tanker made famous by the Strategic Air Command, is credited with making the civil jet age possible in America.

Besides pilots, navigators, engineers and stewardesses, other people also are being trained for the new civil jet age.

Since new devices for handling unprecedented cargo loads have been developed, cargo crews are undergoing training.

The jet age is symbolized by speed, and waiting in line for a ticket has no place in the new scheme of air transportation. New ticketing systems and mechanical and electronic devises to speed all the operations of ticketing have been developed and employees are being trained to operate them.

Even airport police and terminal detectives are undergoing retraining to handle larger crowds imbued with the spirit of moving faster than before.

There will be much more to the new civil jet age than just larger, faster airplanes carrying more people greater distances in a shorter time.

The nature of the airplane itself necessitates basic changes in civilian air transportation. And, to the passenger, air transportation includes ground transportation as well, for he cannot divorce the taxi trip from city to airport from his flight between cities.

Modern Roads, Terminals

Already, ground travel constitutes a significant percentage of the time involved in an "airplane trip" between many cities. The air portion of a trip between cities 500 miles apart now requires about two hours in many standard airliners. The new jets could cut this time nearly in half if ground taxiing, warm-up, waiting, landing pattern, and various other non-productive times can be reduced in proportion to the actual air time reduction.

However, ground travel between airports and cities on most of these flights requires 20 to 40 minutes at each end. The fastest jets cannot reduce the time it takes taxis, limousines or buses to thread their way through traffic.

Herein might very well lie one of the greatest contributions the jet airplane will make to civilian air travel: airline and Government aeronautic officials seeking to realize the jet plane's advantages to the utmost already are urging semi-restricted freeways between airports and the hearts of major cities.

Another characteristic of jet planes, besides their airtime savings, that may help bring about better ground transportation is their great size.

Such huge airplanes, landing at speeds greater than that of piston engine planes, require runways longer than those existing at many major terminals.

Cities faced with the choice between enlarging present airports and building new ones may feel, airline officials hope, that the necessity for improvement will merely present the appropriate opportunity many officials have been awaiting to build new airports.

It then will be much easier, economically and politically, to construct new ground freeways than it would be to enlarge and restrict streets already in use.

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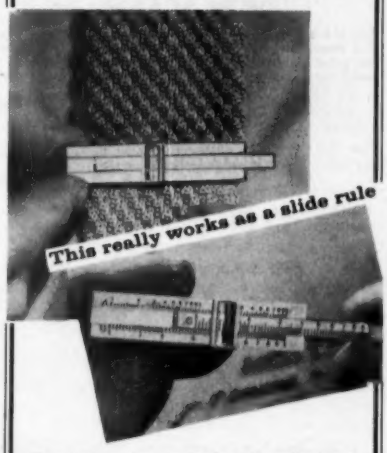

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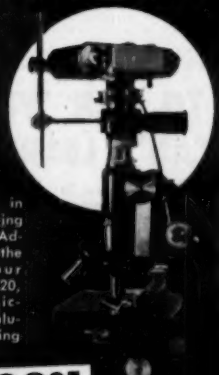

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• Books of the Week •

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

AIRCRAFT COMMUNICATION SYSTEMS—J. H. H. Grover—*Philosophical Lib.*, 127 p., illus., $6. For the British student and flight radio operator; includes section on American equipment.

AVALANCHE—Joseph Wechsberg—*Knopf*, 254 p., maps, $4. Reporter tells the story of the 1954 disaster when snow covered the Alpine village of Blons, Austria.

BEHAVIOR AND PSYCHOLOGICAL MAN: Essays in Motivation and Learning—Edward Chace Tolman—*Univ. of Calif. Press*, new ed., 269 p., illus. paper, $1.95. Collection of papers presented between 1922 and 1948.

THE BIOLOGICAL REPLICATION OF MACROMOLECULES—G. Pontecorvo and others—*Academic*, 255 p., illus., $9.50. Symposium No. XII of the Society for Experimental Biology.

BONE AND RADIOSTRONTIUM—Arne Engström, Rolf Björnerstedt, Carl-Johan Clemedson and Arne Nelson—*Wiley*, 139 p., illus., $8.75. Much of the work described has been performed at the Dept. of Medical Physics at Karolinska Institutet, Stockholm, Sweden.

A CENTURY OF DARWIN—S. A. Barnett, Ed.—*Harvard Univ. Press*, 376 p., illus., $5.75. Fifteen authors of international repute survey not only the Darwinian theory of evolution but also show Darwin as a biologist of extraordinary penetration, industry and scope.

DECISION FOR RESEARCH—*Am. Heart Assn.* with E. R. Squibb & Sons, 7 p., illus., paper, 10¢, free for students and teachers, request direct from publisher, 44 E. 23rd St., New York 10, N. Y. Urges science-minded teen-agers to take stock now and consider whether or not they are cut out for research careers.

DURBAN: A Study in Racial Ecology—Leo Kuper, Hilstan Watts and Ronald Davies, introd. by Alan Paton—*Columbia Univ. Press*, 254 p., illus., $3.75. Analyzing the historical, economic, political, religious, social and legal aspects of residential segregation in Durban, Union of South Africa.

ELECTRIC MACHINERY: A Coordinated Presentation of A-C and D-C Machines—Clifford C. Carr—*Wiley*, 537 p., illus., $9.25. Text treats both A-C and D-C machines as an integrated subject, emphasizing energy conversion.

THE FERTILITY OF AMERICAN WOMEN—Wilson H. Grabill, Clyde V. Kiser and Pascal K. Whelpton—*Wiley* for Social Science Res. Council in co-op. with U. S. Bureau of the Census, 448 p., illus., $9.50. Traces reproduction trends in the U. S. since colonial times.

GOING ON TEN: Book Four of the Basic Health and Safety Program—W.W. Bauer, Dorothy W. Baruch, Elizabeth R. Montgomery and Elenore T. Pounds—*Scott*, 226 p., drawings by Helen Carter, $1.92. A fourth grade textbook.

INTERNATIONAL CODE OF NOMENCLATURE OF BACTERIA AND VIRUSES: Bacteriological Code—Editorial Board, International Committee on Bacteriological Nomenclature—*Iowa State College Press*, 186 p., $3.50. To further the use of correct names of the microorganisms.

INTRODUCTION TO A STUDY OF MECHANICAL VIBRATION—G. W. Van Santen, foreword by B. E. Noltingk—*Macmillan*, 2nd rev. ed., 310 p., illus., $8.50. Treats that border line subject where mechanics meets acoustics.

AN INTRODUCTION TO MATHEMATICS—Alfred North Whitehead—*Oxford Univ. Press.*, new ed., 191 p., illus., paper, $1.50. First published in 1911.

MARCH 1957 MEDICAL SURVEY OF RONGELAP AND UTIRIK PEOPLE THREE YEARS AFTER EXPOSURE TO RADIOACTIVE FALLOUT—Robert A. Conrad and others—*Bookhaven Nat. Lab. (Office of Technical Services)*, 26 p., illus., paper, $1. Discusses acute, subacute and late effects.

MATHEMATICS AND LOGIC FOR DIGITAL DEVICES—James T. Culbertson—*Van Nostrand*, 224 p., illus., $4.85. A course in the kind of mathematical reasoning essential to the use of computers.

MINERALS YEARBOOK 1956, Vol. II: Fuels—U.S. Bureau of Mines—*Govt. Printing Office*, 452 p., $2.50. Minerals-fuel review chapter summarizes developments in the fuel industries, followed by commodity reviews.

NUCLEAR REACTOR METALLURGY—Walter D. Wilkinson, William F. Murphy and Warren J. McGonnagle—*Van Nostrand*, 382 p., illus., $5.60. Treatment is descriptive and qualitative, assumes no previous training in metallurgy.

THE PHYSICAL THEORY OF NEUTRON CHAIN REACTORS—Alvin M. Weinberg and Eugene P. Wigner—*Univ. of Chicago Press*, 801 p., $15. A scholarly, unified account of nuclear reactor physics.

POLAROGRAPHIC ESTIMATION OF THIOPHENES AND AROMATIC SULFIDES IN PETROLEUM—Harry V. Drushel and James F. Miller—*Mellon Institute*, 10 p., graphs, paper, free upon request direct to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa.

PRINCIPLES AND APPLICATIONS OF RANDOM NOISE THEORY—Julius S. Bendat—*Wiley*, 431 p., $11. For students of statistical communication theory, systems analysis, automatic control, meteorology, radar, and other fields.

THE PUBLIC IMPACT OF SCIENCE IN THE MASS MEDIA—Robert C. Davis—*Survey Res. Center, Univ. of Mich.*, 254 p., paper, $3.50. Report on a nation-wide survey for the National Association of Science Writers. See SNL p.

READINGS IN MEDICAL CARE—Willard C. Rappleye and others, foreword by George Packer Berry—*Univ. of N. C. Press*, 708 p., $6.50. Edited by Committee on Medical Care Teaching of the Ass'n of Teachers of Preventive Medicine. Textbook recording changes in the patterns of organization of medical care and health service.

SCIENCE IN A TAVERN: Essays and Diversions on Science in the Making—Charles S. Slichter—*Univ. of Wis. Press*, 2nd ed., 206 p., paper, $1. Collection of Dean Slichter's commemorative addresses.

SCRIPTA MATHEMATICA: Memorial Issue 1957—Abe Gelbart, Ed.—*Yeshiva Univ.*, 236 p., illus., paper, $4. Combines 4 quarterly issues in commemoration of its late founder and editor for 25 years, Jekuthiel Ginsburg.

SEVENTH AGARD GENERAL ASSEMBLY: Proceedings — T. von Karman, Chairman — *Advisory Group for Aeronautical Research and Development*, 102 p. illus., paper, single copies free upon request direct to NACA, 1512 H Street, NW, Washington 25, D. C. Includes Round Table discussion "Toward Higher Altitude".

SOONDAR MOONI: The Life of an Indian Elephant—E. O. Shebbeare, introd. by the Rt. Hon. Richard Casey—*Houghton*, 202 p., illus. by author, $3.50. The author spent more than forty years in the Indian Forest Service and Malaya in wild elephant country.

STROKES: A Guide for the Family—*Am. Heart Ass'n*, 18 p., illus., paper, free upon request direct to publisher, 44 E. 23rd St., New York 10, N. Y.

THEORY OF ELECTRICAL MACHINES—W. S. Wood—*Butterworth & Co. (Canada)*, 317 p., illus., $10. Suitable for senior electrical engineering students.

VINYL RESINS—W. Mayo Smith—*Reinhold*, 282 p., illus., $5.75. Describes types and applications of this most versatile and largest selling family of plastics.

WHITETAIL: The Story of a Prairie Dog—Rutherford G. Montgomery—*World Pub. Co.*, illus. by Marie Nonnast, 64 p., $2.50. For the young reader.

WILD FOLK IN THE DESERT—Carroll Lane Fenton and Evelyn Carswell—*Day*, 128 p., illus. by C. L. Fenton, $3.50. Shows how plants and animals manage to prosper in the arid regions of the U. S. West.

WILDLIFE OF THE INTERMOUNTAIN WEST—Charles Yocom, Vinson Brown and Aldine Starbuck—*Naturegraph*, 144 p., illus., paper, $2.50. Helps you identify the plants and animals of the region between the Northern Rockies and the Mohave Desert.

ZOO HUNT IN CEYLON—Heinz Randow, transl. from German by Charles Johnson—*Doubleday*, 230 p., illus., $4. Tells how author went about capturing rare animals in southern India.

Science News Letter, September 20, 1958

The *aurora* is generally thought to be produced when protons expelled from the sun enter the upper atmosphere, exciting the gases there to luminosity.

A small window, inserted into the head of experimental monkeys, has allowed physicians to watch *anti-coagulant drugs* ward off stoppages in brain arteries.

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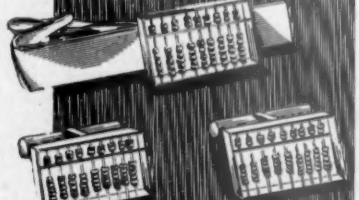

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Questions

AERONAUTICS—How many gallons of kerosene will the average jet carry? p. 186.

CHEMISTRY—What advantages would there be in vulcanizing rubber by using irradiation? p. 183.

MEDICINE—What is the effect of vitamin-A deficiency on eyesight? p. 180.

Photographs: Cover, U. S. Atomic Energy Commission; p. 179, General Motors Corporation; p. 181, Truscon Division, Republic Steel Corporation; p. 183, Rayonier Eastern Research Division; p. 186, Boeing Airplane Company-Pan American World Airways; p. 192, Damar Products Inc.

MEDICINE

Hay Fever Hits Prisoners And the Aristocracy

➤ SNEEZES, itches and other allergic symptoms aggravate prison populations as well as the old-time favored aristocracy.

A survey of prisoners in the District of Columbia led to this conclusion by Dr. Harry S. Bernton, an allergist at Doctors Hospital, Washington.

Dr. Bernton initiated his survey because of the idea that "royalty, aristocracy, learning and culture characterized the allergic of bygone days." He referred to a report in 1873 by C. H. Blackley in London who said: "Hay fever is said to be an aristocratic disease, and . . . it is rarely, if ever, met with but among the educated."

This and many other old-time reports prompted Dr. Bernton to go into the prisons. He came out with the impression that hay fever and other allergic traits are everyman's ailments, although prisoners do seem less prone than some other groups.

As reported by him in the *Medical Annals* of the District of Columbia, 328 of 1,500 prisoners gave positive history of allergy.

Since many scientists are of the opinion that many allergies are related to emotional disturbances, Dr. Bernton cited several possible emotional causes among prisoners, such as grief, remorse, a sense of frustration, disappointment, resentment and rejection. However, he interviewed three prisoners awaiting the death penalty, and none had any history of allergy.

The total percentage of allergy among the prisoners appears to be somewhat lower than among the general population, leading Dr. Bernton to speculate if there is a psychic inhibition of the allergic mechanism in such groups.

Science News Letter, September 20, 1958

Do You Know?

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Agricola	Lamarck
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Copernicus	Newton
Curie	Oppenheimer
Dalton	Pascal
Darwin	Planck
Descartes	Pliny
de Vries	Poincare
Dutrochet	Priestley
Einstein	Ptolemy
Faraday	Redi
Galileo	Roentgen
Gay Lussac	Sarton
Geber	Schoele
Gilbert	Schwann
Halley	Spallanzani
Harrison	Stahl
Harvey	Swammerdam
Hertz	Theophrastus
Hippocrates	Thomson
Ingen-Housz	Van Helmont
Jeans	Van Leeuwenhoek
Jenner	Vesalius
Kepler	Volta
Koch	Wohler

And others — 83 in all

THE EDITORS

GEORGE SCHWARTZ, Fellow of the New York Academy of Science, is a prominent science educator. *PHILIP W. BISHOP*, Head Curator, Department of Arts and Manufactures, U.S. National Museum, Smithsonian Institution.

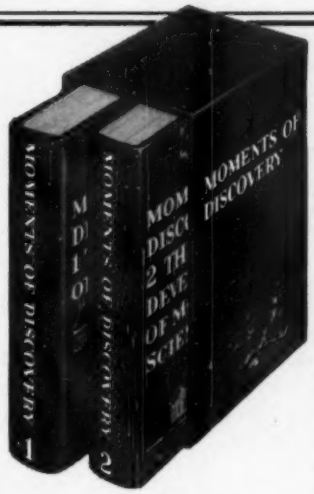
THIS unique two-volume set brings together the personal, first hand accounts of the dramatic "moments of discovery" that have contributed to the advance of science — from its beginnings in the ancient world to the present day. These epochmaking discoveries take on new significance when re-created in the actual words of the men who made them, providing meaningful new insights into the nature and growth of science.

How, for example, did the minds of the great astronomers actually work? Tycho Brahe, writing in 1572, begins: ". . . in the evening . . . I noticed that a new and unusual star . . . was shining directly over my head where there never before had been any star.".

Or, what was it like to peer into the new world of the microscope in the 17th century? Van Leeuwenhoek delightedly reports ". . . many little animalcules very prettily a-moving . . . sometimes stuck out two little horns." Van Leeuwenhoek did not realize their significance, but the reader of MOMENTS OF DISCOVERY — thanks to the editors' commentary — more fully appreciates the importance of the achievement in a broad scientific perspective.

You relive with Edward Jenner the first fateful test of his smallpox vaccine: ". . . I selected a healthy boy about eight years old, for the purpose of inoculating for the cowpox. The matter was taken from a sore on the hand of a dairymaid, who was infected by her master's cows, and it was inserted, on the fourteenth day of May 1796, into the arm of the boy."

In MOMENTS OF DISCOVERY, nearly one hundred such great events in science are brought to life in the words and drawings of the scientists themselves. Scarcely a name or discovery of consequence has been omitted. Aristotle and Archimedes . . . Geber and Agricola . . . Galileo, Newton, Cavendish, Halley, Thomson and others.



More than one fourth of the boxed set is devoted to biographical, cultural and historical commentaries by the editors which amplify the meaning of the achievements of the great scientists. Through them, the reader is afforded an accurate perspective from which to relate past scientific accomplishments to contemporary progress, problems, prospects and to the unity of science itself.

Volume One, *The Origins of Science*, depicts the evolution of scientific thinking up to the scientific revolution of the 17th and 18th centuries. Volume Two, *The Development of Modern Science*, knits together the strands of accumulated knowledge in biology, chemistry, physics, astronomy, medicine, electronics and other epochal advances of *modern* times.

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HIGHWAY SAFETY MARKER for car owners looks like a dunce cap. The marker is designed to be placed 30 to 60 feet from a disabled automobile to warn other drivers. Made of a waterproof material, the marker is 10 inches high and yellow in color.

Science News Letter, September 20, 1958

QUICK-CLEANING FILE, designed to cut soft or hard metals, woods and plastics, has a disk control which, when turned, breaks up accumulated particles on its teeth. The file has a handle that can be used vertically, horizontally, or made right- or left-handed. It is available in mill or shell types.

Science News Letter, September 20, 1958

DOOR ANSWERER permits someone to answer calls at outside doors without leaving his or her work. The three-station electronic receptionist operates from 117 volts, 50/60 cycles AC, or 117 volts DC power source. No power is used unless the talk-listen switch is operated.

Science News Letter, September 20, 1958

LAMPSHADE SLIP COVERS, shown in the photograph, are designed to be used to renovate old shades. They are made of rayon, interlaced with gold metal yarn. One size of the gold and white lampshade covers fits all shades from 10 to 20 inches in diameter.

Science News Letter, September 20, 1958

INSULATED ALUMINUM WINDOW, internally weather-sealed by means of a two-piece frame, has a glass fiber screen for insect control. The window is available in single hung, horizontal slide and fixed sash models. The screen can be removed for cleaning and repairing.

Science News Letter, September 20, 1958

PUBLIC ADDRESS SYSTEM is designed for high intelligibility of speech for distances up to three-quarters of a mile. The self-contained unit has a rechargeable nickel-cadmium 28-volt battery and an output power switch ranging from 25 to 200 watts.

Science News Letter, September 20, 1958

FOLDING RECORD SCREEN is a three-paneled black wrought iron holder that has 15 compartments. Each compartment holds up to seven 12-inch LP albums. The screen can be used as a room divider. Each fully assembled panel measures six feet high, 12½-inches wide and 2½-inches thick.

Science News Letter, September 20, 1958

AUTOMATIC CHOPSTICKS are joined together and hinged with a small spring. They can be used for eating and as sugar tongs. The chopsticks are inlaid with a random pattern of mother-of-pearl and available in either black or red and with either silver or gold plate chips.

Science News Letter, September 20, 1958

Nature Ramblings

By BENITA TALL

➤ SCIENTISTS have discovered the "Adam" of the cucurbits, the family of plants that includes the squashes, pumpkins and ornamental gourds.

The small, green, pear-shaped gourd found growing wild in the gardens of the Maya Indians of Central America holds for horticulturists the promise of larger, tastier and more nutritious squash and pumpkins.

The reason for this is that crosses made with the ancient gourd, which has the scientific name *Cucurbita Lundelliana* in honor of Dr. C. L. Lundell who discovered it, and other cucurbits produce seed that will live. None of the domestic species of squash and pumpkins, for example, can be cross bred and produce viable seed. This has meant that scientists have been limited in their attempts to improve the plants. Results of crosses among the cucurbits were also unpredictable as to shape and other characteristics.

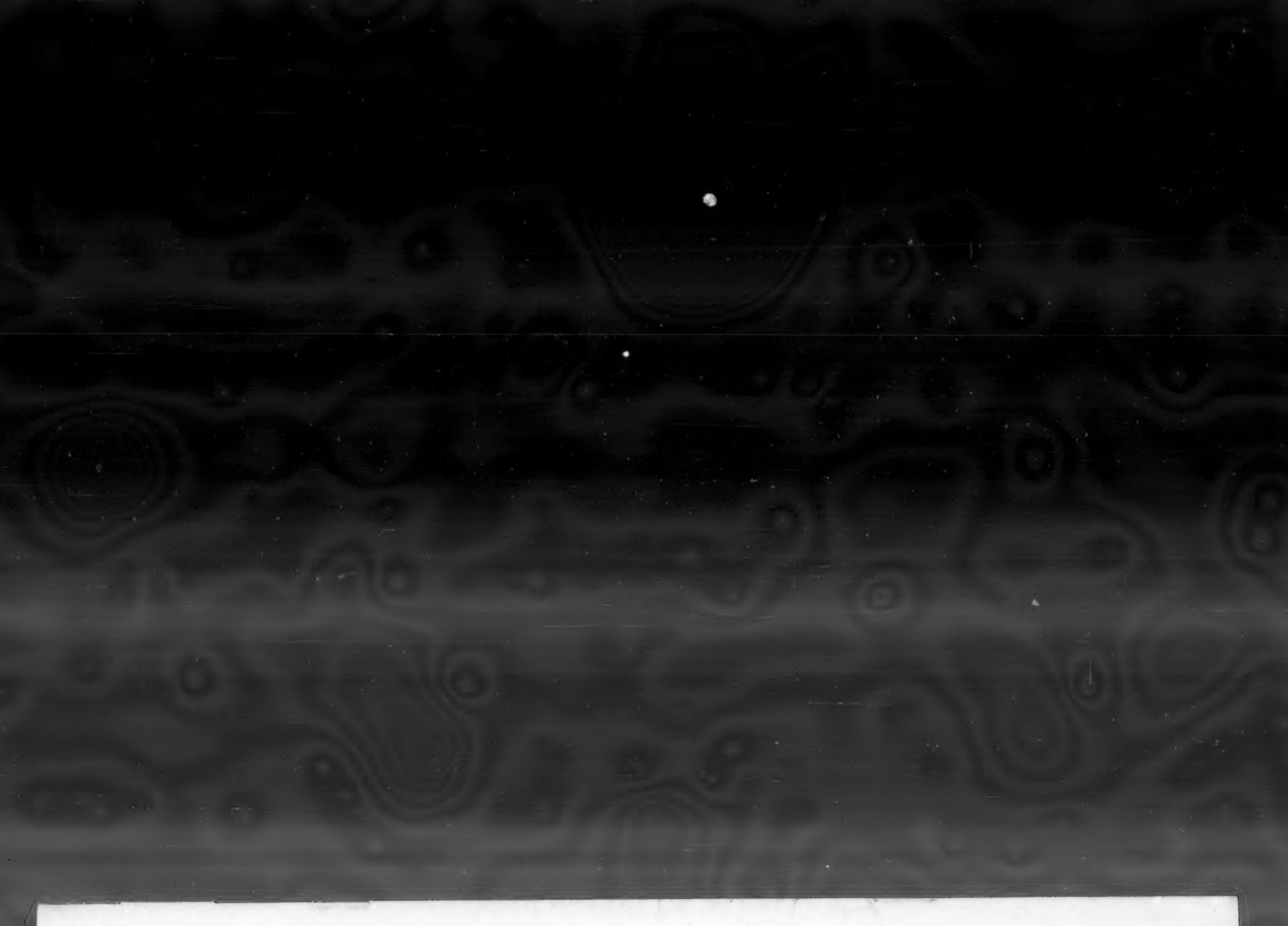
An Ancient Gourd

With many important food plants, scientists try to introduce "wild blood" in the form of an uncultivated species for breeding better plants. Usually the wild plant is more disease- and insect-resistant.

The new gourd is being used as a kind of bridge connecting the wild and cultivated species of pumpkins and squashes, transferring the desirable qualities from one to the other. Many of the resultant hybrids produce healthy and luscious fruits with improved flavor and nutritional qualities as well as highly developed root and vine systems.

This ability to cross breed with wild and cultivated species indicates that *Cucurbita Lundelliana* is probably the ancestor of all the cultivated species.

Just as the small green gourd contributed to the agriculture of the Mayas as far back as 5,000 years ago, it is contributing to the agriculture of today.

Dr. Lundell discovered the fruiting vine of the small cucurbit while he was botanist and director of the 1933 Carnegie Institution of Washington-University of Michigan expedition into the lowlands of the Department of Peten in Guatemala. Other researchers, including the late Dr. L. H. Bailey of Cornell University, became interested in the ancient gourd and carried on breeding experiments with the plant and related species.

Science News Letter, September 20, 1958